CARIBBEAN DISASTER RESPONSE AND RECOVERY

ISSUE SUMMARY:

EPA provided a robust response to Hurricanes Irma and Maria in the Caribbean. The agency worked closely with the Governments of Puerto Rico and the U.S. Virgin Islands (USVI), as well as municipal governments, non-governmental organizations, academia, and communities, in its multi-faceted response.

Both jurisdictions continue to struggle with pre-existing financial, technical and management challenges. These challenges, in combination with the resulting strain from the storm impacts and recent earthquake events (in Puerto Rico), have in many ways overburdened the recovery efforts. Additionally, there has been substantial turn-over in the Government of Puerto Rico over the last year, both at the gubernatorial level and among local Commonwealth Agency heads.

EPA remains very involved in disaster recovery efforts, and is working in an intense, remedial and collaborative fashion to address these multiple challenges. EPA's goal is to use federal response and recovery resources, in collaboration with other federal and local agencies and their resources, to build local governmental capacity and ensure that government management systems are reliable and sustainable. Response and recovery resources, if wisely invested and coordinated with year-to-year federal and local resources, can be transformative in the Caribbean jurisdictions. EPA Region 2 work is being reinforced by EPA Headquarters, as well as through the Recovery Support Function Leadership Group (RSFLG, a senior-level inter-agency group of federal officials). EPA has been able to detail three staff (a PR Sustainability Advisor, a PR Water Advisor, and a USVI Sustainability Advisor) to work out of the local FEMA Joint Recovery Offices on disaster recovery efforts, through Interagency Reimbursable Work Agreements (IRWAs) with FEMA.

UPCOMING MILESTONES:

- Draft Puerto Rico CDBG-Mitigation Action Plan (Comments due: Wednesday, November 4, 2020)
- Draft USVI CDBG-Mitigation Action Plan (Comments due: TBD, Week of November 22, 2020)
- Standard Operating Procedures for the Regional Implementation of the EPA Order on Disaster Recovery and Mitigation

BACKGROUND:

PUERTO RICO DISASTER EMERGENCY RESPONSE:

EPA's disaster emergency response efforts in Puerto Rico included:

- **Assessments of Regulated Facilities:** After the hurricanes, EPA assessed 233 wastewater treatment plants and pumping stations; 237 rural "Non-PRASA" (Non-Puerto Rico Aqueduct and Sewer Authority)

community drinking water systems; and 177 chemical and hazardous waste and oil facilities. EPA did not identify any major chemical, hazardous or oil spills or releases from facilities. EPA also has been reassessing affected facilities in response to the 2019-2020 earthquakes.

- **Collection of Household Hazardous Wastes (HHW), White Goods (e.g., household appliances), and E-Waste:** The U.S. Army Corps of Engineers (USACE) had the lead for helping Puerto Rico manage its non-hazardous storm debris, including vegetative debris. EPA had a support role working closely with the USACE to segregate hazardous wastes, white goods, and electronic waste (e-waste) from the non-hazardous debris. Following the storms, EPA collected more than 322,000 containers in support of FEMA's Debris Removal Mission, including more than 96 tons of solid hazardous waste, 1,500 gallons of liquid hazardous waste, 561 tons of solid non-hazardous waste, and 8,600 gallons of liquid non-hazardous waste. All items were transported off-island for proper disposal or were recycled or reused in PR (keeping them out of landfills with limited capacity, and out of harm's way). Items included different types of containers, drums, propane tanks, cylinders, electronics, batteries, and extracted freon. In addition, EPA undertook significant collection efforts through many curbside collection and stationary events between November 2017 and May 2018. EPA operated a robust public outreach program, including more than 100 community coordinators, to support this work. EPA also operated several collection pads in PR to perform household hazardous waste (HHW) testing, consolidation, packaging and documentation, and to facilitate shipping of the HHW after refrigerant extraction by EPA. In support to a U.S. Coast Guard mission, EPA assessed 377 sunken or grounded marine vessels and removed hazardous substances from them where necessary and feasible.

- **Restoration of Puerto Rico Environmental Quality Board's Laboratory:** EPA supported efforts of the PR Environmental Quality Board (EQB) to restore its science laboratory to full capability for microbiological and chemistry analysis, including supporting utility systems and construction. EPA evaluated infrastructure, equipment and training needs for aiding the operational stability of the laboratory. In order to support these needs, EPA ordered and received laboratory equipment, supplies and services. As a result of the joint efforts between EPA and EQB, a state-of-the-art environmental research facility has been constructed and has begun preliminary operations to help preserve, conserve and protect public health and the environment

- **Restoration of Puerto Rico Air Monitoring Network:** EPA was tasked to work in close coordination with EQB in repairing and/or restoring 19 fixed Ambient Air Monitoring stations throughout the island. These stations provide air monitoring and sampling for Particulate Matter (PM2.5 and PM10), Lead, Ozone, Nitrogen Dioxide, Sulfur Dioxide, and Carbon Monoxide. All the monitoring stations were assessed to determine what repairs were needed to make them operational. Repairs were made to the stations which included interior/exterior repairs and repositioning and anchoring shelters. All the replacement monitoring equipment was procured and delivered to PR. The PR Department of Natural and Environmental Resources (DNER) has installed all the monitoring equipment at the stations except for two sites which are in the process of being relocated and established.

- **Drinking Water Quality Sampling**: Due to infrastructure damage to PRASA and non-PRASA public water systems sustained during Hurricane Maria, EPA was tasked by the PR Department of Health (PRDOH) through a FEMA Mission Assignment to conduct drinking water quality sampling for microbiological parameters at PRASA and non-PRASA water systems. A total of 460 drinking water samples were collected by EPA and provided to PRDOH, enabling protection of public health by reducing the potential risk of adverse health effects associated with compromised water distribution systems.

- **Non-PRASA Community Water Systems Power Restoration and Temporary Repairs:** There are approximately 240 non-PRASA community water systems located in the most remote areas of PR that serve approximately 3% of the island, or about 100,000 customers. These community systems are defined as public drinking water systems under the federal Safe Drinking Water Act. Some serve as few as 30 residents, although some serve in excess of 2,200 people. EPA was given a Mission Assignment to assess, restore power, and repair non-PRASA drinking water systems located in remote areas of PR. From September 2017 through May 2019 EPA assessed over 60 non-PRASA systems and determined that many of the systems would need federal assistance in order to restore reliable, uninterrupted power and full system operation. By providing 21 generators, and fuel and maintenance for those generators, EPA supported non-PRASA systems that had no power as much as eight months after the hurricanes.

- **No Action Assurances and Fuel Waivers:** EPA worked closely with the local government to issue a combination of No Action Assurances and fuel waivers to assist in energizing homes, water and wastewater treatment facilities and regulated facilities, after the 2017 hurricanes (and again after the 2019-2020 earthquakes).

- **Landfill Capacity Assessments:** There are approximately 28 active landfills in PR, most of which are unlined and considered open dumps. Solid waste management has been a challenge for PR that predates the 2017 hurricanes. In April 2019, FEMA estimated that the storms generated approximately 12 million cubic yards of debris. There was also an increase in illegal dumping after the hurricanes. EPA, through a FEMA mission assignment, completed a landfill capacity assessment (PR Landfill Assessment), which concluded that PR lost between 1.7 and 2.5 years of landfill capacity due to the storm debris. The EPA assessment calculated that as of June 2019, PR had between one and two years of remaining landfill capacity, excluding the disposal of remaining demolition debris, which could result in continued overfill of open dumps. However, the PR Landfill Assessment also concluded that PR has significant potential capacity through the construction of new lined cells at more than eight current landfills. (The capacity estimates in the PR Landfill Assessment do not account for debris resulting from the ongoing earthquakes that began in December 2019.)

USVI DISASTER EMERGENCY RESPONSE:

EPA's disaster emergency response efforts in the USVI included:

- **Assessments of Regulated Facilities:** Right after Hurricanes Irma and María, EPA assessed 8 municipal wastewater treatment plants and 123 chemical and hazardous waste and oil facilities. EPA did not identify any major chemical, hazardous or oil spills or releases from facilities.

- **Collection of Household Hazardous Wastes, White Goods, and E-Waste:** The US Army Corps of Engineers (USACE) had the lead for non-hazardous storm debris, including vegetative debris. EPA worked closely with the USACE to segregate hazardous wastes, white goods, and electronic waste from the non-hazardous debris. EPA collected more than 145,500 containers in support of FEMA's Debris Removal Mission, including more than 38 tons of solid hazardous waste, 1,800 gallons of liquid hazardous waste, 143 tons of solid non-hazardous waste, and 3,600 gallons of liquid non-hazardous waste. All items were transported off-island for proper disposal, recycling or reuse, keeping them out of landfills and out of harm's way. Items included different types of containers, drums, propane tanks, cylinders, electronics, batteries, and extracted freon.

- **Collection of Medical Wastes:** EPA collected more than 150 tons of medical waste that was bagged and transported out of the USVI for proper disposal off- island.

- **Drinking Water Monitoring:** EPA collected more than 2,400 drinking water samples and analyzed them to advise system operators about any problems with the quality of their drinking water.

- **Assessment and Removal of Sunken or Grounded Vessels:** In support of a US Coast Guard mission, EPA assessed 477 sunken or grounded vessels and removed hazardous substances from 327 of them.

- **Air Quality Monitoring:** EPA conducted air quality monitoring around marine vessel operations and construction and demolition debris operations to safeguard health and safety.

CARIBBEAN DISASTER RECOVERY:

FEMA, along with other Federal agencies, implements the National Disaster Recovery Framework (NDRF) to guide and promote effective recovery, particularly for those incidents that are large-scale or catastrophic; specifically, through the activation of Recovery Support Functions (RSFs). The RSFs are organized into six manageable components, each with a lead coordinating agency. These are:

- **Community Planning and Capacity Building (CPCB) RSF** [Lead: FEMA]
- **Natural and Cultural Resources RSF** [Lead: US Department of Interior]
- **Economics RSF** [Lead: US Department of Commerce]
- **Health and Social Services RSF** [Lead: US Department of Health and Human Services]
- **Housing RSF** [Lead: US Department of Housing and Urban Development]

- **Infrastructure Systems RSF** [Lead: US Army Corps of Engineers]

In October 2017, EPA's Office of Policy, with input from the EPA regions affected by disasters, developed the following recovery objectives for the agency:

1. **Provide assistance to Local Governments –** Provide assistance so that infrastructure recovery projects and efforts consider and address key environmental needs, requirements and standards.
2. **Build preparedness to mitigate future events –** Lessen the impacts of disasters by assisting federal, state and local agencies and communities prior to disasters.
3. **Promote sustainable and resilient rebuilding -** Use EPA's expertise to inform communities, states and federal partners about rebuilding for the long-term viability of regions' people, economies, and natural ecosystems.
4. **Apply EPA's Knowledge –** Provide EPA's expertise to other federal agencies, states, and communities in areas of EPA responsibility, such as drinking and wastewater infrastructure, brownfields, air quality, or oil and hazardous materials clean-ups.
5. **Streamline Federal Action -** Work with our partner agencies to streamline federal oversight to efficiently fulfill statutory, permitting and/or enforcement requirements in a timely fashion.
6. **Partner with Environmental Justice (EJ)/Disadvantaged Communities –** Actively engage vulnerable and overburdened communities so they can meaningfully participate and have their issues addressed during recovery operations and planning.

In PR and the USVI, EPA participated in recovery assessments in the RSFs, along with local government partners, to provide a springboard upon which to design and implement joint recovery strategies. EPA's top priorities include access to clean drinking water, supporting wastewater infrastructure, and work to address solid waste issues exacerbated by the hurricanes. EPA's goal is to assist the governments of PR and the USVI to ensure that infrastructure recovery projects address key environmental needs, meet requirements and standards, build preparedness to mitigate future events, and promote economically sustainable and resilient rebuilding. EPA is actively working with FEMA and other federal agencies to reposition our resources, leveraging more partners and more funding opportunities with a goal of addressing long-standing challenges and environmental concerns.

EPA's success stories with disaster recovery include:

- **Solid Waste Management** – EPA is working closely with the PR Department of Natural and Environmental Resources (DNER) and the USVI Department of Planning and Natural Resources (DPNR), assisting in the development of a compliant solid waste management program and ensuring strategic use of the supplemental funding assigned by the Bipartisan Budget Act ($50 million in total; please see transition document on Caribbean Solid Waste Issues for more details). Upgrading the islands' capabilities is essential to managing solid waste safely and sustainably. Local agencies are short on staff, and therefore unable to undertake the most basic tasks of solid waste management. EPA's engagement with the local governments

is focused on helping to advance the implementation of projects using supplemental funding and providing the basic organizational structure to accept and process applications for permitting new compliant landfill cells or to inspect existing landfills and close open dumps.

- **Leaking Underground Storage Tanks (LUST)/Underground Storage Tanks (UST)** – In 2019, EPA fully awarded $3.5M in supplemental LUST Trust funds to PR. These funds will allow the PR government to investigate and cleanup LUST sites that were caused by, or may have been impacted by, Hurricanes Irma and Maria. An additional $400,000 in LUST Trust Funds was also allocated to the USVI. VIDPNR will be using these funds for contractor support to perform tank tightness testing; and investigate and, if necessary, remediate confirmed releases to the environment throughout the USVI. The project/budget period for the award is five years, extendable to seven years.

- **Superfund National Priorities List (NPL) Sites Assessments and Non-NPL Sites Reassessments -** NPL sites have been inspected and/or sampled in PR and the USVI and the data generated by these efforts is currently being assessed. EPA continues to assess what additional sites warrant sampling. All non-NPL site reassessments funded with supplemental funding have been completed and reports have been finalized.

- **PR Clean Water and Drinking Water State Revolving Funds (SRF) -** In July 2016, after many years of successful repayment, the PR Aqueduct and Sewer Authority (PRASA) was unable to meet its SRF loan repayment obligations. PRASA loans had to be declared in forbearance while EPA, DNER, PR Department of Health (DOH) and PR Infrastructure Financing Authority (PRIFA) worked in good faith with PRASA to develop a restructuring agreement for PRASA's debt. Two restructuring agreements were executed on July 26, 2019 – one for PRASA's outstanding Clean Water SRF debt, and one for its outstanding Drinking Water SRF debt (collectively, SRF debt), for a total of $514 million in restructured debt. This restructuring cleared the way for the Commonwealth's idled SRF programs to once again provide critically needed funding to improve PR's water and sewer systems, create local jobs, and ensure that the people of PR have safe and clean water. The Bipartisan Budget Act allows a non-federal match waiver for both the clean water and drinking water capitalization grant funds awarded to the PR government. The match waiver applies to active awards on obligated funds up until February 2018. Since the restructure agreements were executed, a total of $39.1 M has been disbursed for infrastructure projects in PR, including energy and stormwater projects, environmental studies, and infrastructure planning and design. Of that total, $6.4 M is reimbursement for work completed on projects after the hurricanes.

- **PR non-PRASA Community Drinking Water Systems - EPA/Federal and Local Partners/NGO Water Coalition:** After assessing more than 240 small, rural community drinking water systems that are *not* operated by the Puerto Rico Aqueduct and Sewer Authority (PRASA), EPA teamed up with several non-governmental organizations and established a Memorandum of Understanding (MOU) tapping into over $13 M dollars of private funding pledged by NGOs to build capacity, support infrastructure repairs and make rural drinking water systems more resilient to power outages. Through the MOU, EPA facilitates collaboration between federal, local PR government agencies, and NGOs to help communities be more resilient to storms and provide technical assistance in compliance with local and federal safe drinking water

requirements. Under the MOU, NGOs assisted numerous non-PRASA systems to install solar panels and back-up battery storage. During the island-wide electric power outage after the January 7, 2020 earthquake, these systems were able to continue providing drinking water to their customers.

- **Healthy Buildings Recovery Task Force -** In collaboration with federal and local agency partners, universities and NGOs, EPA has been promoting a sound, long-term recovery initiative that is focused on wisely renovating/rebuilding the numerous damaged homes, public housing units, schools and other public buildings across the islands. This is being accomplished by integrating housing (a social determinant of health) with the indoor and outdoor environment, and includes workforce development strategies delineated by target audiences. Also, local and federal partners are directing strategies to train the local unemployed workers in environmental skilled trades (mold/lead/asbestos remediation, etc.) which increases the local workforce capacity, guarantees sustainable career paths and certifies that the workers are following EPA regulations/guidelines, thus protecting workers and the occupants.

- **Caribbean Septic Systems Working Group** - EPA launched the Caribbean Septic Systems Working Group to engage communities, NGOs, and local government agencies to help make septic systems more sustainable and resilient to storms. About 1.4 million people, or approximately 40% of PR's population, rely on septic systems to manage their sanitary wastes. In the USVI, approximately 50% of the population is served by septic or private wastewater systems. Many of these systems may be inadequate or failing. EPA committed $50,000 of contract support to build septic systems management capability in PR through the development of a proposed framework for building a geospatial tool that will help to build capacity for environmental/public health analytics, and possible targeting for building code enforcement.

- **Brownfields/Workforce Development Training -** In its continuing efforts to help the Caribbean recover from the long-term impacts from Hurricanes Irma and Maria, EPA and its Brownfield technical assistance provider, the Center for Creative Land Recycling (CCLR), have hosted numerous capacity building workshops. These events provided municipalities, NGOs, and communities the tools necessary to revitalize their neighborhoods, as well as to explore local workforce development opportunities for jobs associated with investigation and remediation work involving contaminated properties. Representatives from multiple federal agencies, including EPA, the Economic Development Administration, FEMA, and the Departments of Transportation, Housing and Urban Development, and Department of Agriculture's Rural Development, shared information about how their programs and resources can help support local recovery and redevelopment priorities, including housing, infrastructure development, flood management, resilience and mitigation planning, and Opportunity Zones.

- **Renewable Energy Microgrid study for Culebra:** Hurricane Maria made landfall on September 20, 2017 and rendered the island Municipality of Culebra without electricity for approximately three months until two diesel generators were used to provide power. Through a partnership with the U.S. Energy Department's National Renewable Energy Lab (NREL), and contractor support through EPA's RE-Powering America's Land Initiative, EPA was able to conduct a renewable energy resiliency study for Culebra and its approximately 1,800 residents. In coordination with the municipality and a local NGO, Mujeres de Islas, and in collaboration

with the University of Puerto Rico-Mayagüez, the parties conducted energy resilience site assessments on the island. Five critical buildings were identified, as well as open lands that could be considered for beneficial reuse/redevelopment as a resilient renewable energy hybrid microgrid system. The buildings were the health clinic, police station, fire station, municipal building, and wastewater treatment plant; with solar power, these and other sites could fully provide the island's current and projected energy demands. EPA presented the study to the Mayor of Culebra, the U.S. Economic Development Administration (EDA) and NGOs. In collaboration with partners, EPA explored implementation of renewable energy alternatives identified in the report; and in June 2019, EDA announced a $4.1 M grant, with $1 M in local fund matching from Community Foundation for Puerto Rico (an NGO), to install a microgrid system to support businesses and critical services in Culebra. Should further funding become available to EPA, other municipalities in PR could benefit from a similar renewable energy resiliency study to inform them of potential locations for renewable energy hybrid microgrids, annual energy generation and estimated costs to install such systems.

- **Energy Efficiency - Development of Energy Star Certification for the Caribbean:** EPA just released the ENERGY STAR Certified Homes Caribbean Program Requirements, Version 3. This updates the program requirements for PR and the USVI, based on periodic stakeholder feedback about challenges implementing the prior version of the requirements in those locations. (For example, while most Caribbean residents rely on natural cross ventilation for much of the time to maintain a comfortable indoor environment, the ENERGY STAR guidelines did not contemplate use of a combination of natural and mechanical ventilation in a cost-effective way; it was either one or the other.) The ENERGY STAR program can play an important role in the recovery efforts in the islands by leveraging federal funds to label new homes that are energy-efficient, while having mandatory features to improve their comfort, durability, and quality. ENERGY STAR-certified homes are at least 10% more energy efficient than homes built to code, and on average achieve a 20% improvement. A thriving ENERGY STAR program will also produce a robust, third-party verification infrastructure on the islands, enabling services in the future related to code compliance, indoor air quality programs, and other above-code green programs.

- **Proposed Caribbean Disaster Recovery Collaborative -** In January 2020, EPA Region 2 Regional Administrator Pete Lopez proposed to the federal Recovery Support Function Leadership Group (RSFLG) that the various involved federal and local government agencies create a Collaborative, similar to that created in the New York/New Jersey area after Hurricane Sandy in 2012, to coordinate planning and implementation of major recovery projects. The RSFLG members have indicated support for that proposal.

KEY EXTERNAL STAKEHOLDERS:

☒ Congress ☒ Industry ☒States ☐ Tribes ☒ Media ☒ Other Federal Agency
☒ NGO ☒ Local Governments ☒ Other

MOVING FORWARD:

The viability of EPA's recovery work relies heavily on the relationships that we have with our partners. EPA will continue to build on its partnerships with the Governments of PR and the USVI, local communities, other federal agencies and non-governmental and professional organizations, among others.

There are many challenges faced in the recovery process. One of them is the local governments' lack of financial management capability, ability to process federal grants, and liquidity, as well as lack of staffing, subject matter experts, and resources. EPA is exploring a wide range of options, to address such challenges. EPA Region 2's comprehensive and heavily subscribed engagement is the foundation for a strong, resilient recovery that assures the protection of public health and the environment, as well as the preparation for future extreme weather events.

For EPA Region 2, it has been challenging to fill positions to provide critical support in recovery efforts to our federal and local partners on a long-term basis. Region 2 has identified the following staff positions needed for recovery: (1) Caribbean Disaster Recovery Coordinator; (2) PR Sustainability Advisor; (3) USVI Sustainability Advisor; and (4) Water Infrastructure Advisor in PR. The region has been able to fill some of the key Team positions through details for periods of approximately three months to a year. This represents a challenge for continuity and transfer of knowledge in recovery support for each sector, project, or initiative in which EPA is engaged. Identifying candidates for short term details has been challenging. Region 2 has reached out to EPA Headquarters and other regions for support; such details are very helpful, but are financially burdensome (as Region 2 must, in most cases, cover the detailee's base salary). And, of course, when Region 2 or other EPA employees are detailed into these positions, they are not available to carry out their regular duties.

LEAD OFFICE/REGION: REGION 2	OTHER KEY OFFICES/REGIONS:
Office of the Regional Administrator (RA) SEMD, CEPD, SPO, LCRD	All EPA Region 2 Divisions